



National Park Service
U.S. Department of the Interior

Big South Fork National
River & Recreation Area

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Big South Fork NRRRA News Release

For Immediate Release

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BIG SOUTH FORK RELEASES ENVIROMENTAL ASSESSMENT FOR PLUGGING ABANDONED GAS WELL

The National Park Service has released an Environmental Assessment (EA) for the plugging and abandonment of a gas well in the Williams Creek area of Big South Fork National River and Recreation Area. The purpose of this Environmental Assessment is to evaluate all threats to the human and the natural environment in Big South Fork NRRRA.

The agency's preferred alternative is to plug the well. Under this alternative the access road and area around the well would be opened and the well would be plugged. When work is completed the area around the well would be rehabilitated and the access road would be stabilized.

Copies of the well plugging environmental assessment are available by writing Superintendent, Big South Fork, 4564 Leatherwood Road, Oneida, Tennessee, 37841, by contacting Big South Fork NRRRA Headquarters at (423) 569-9778, or on the internet by clicking the Well Plugging EA link found at www.nps.gov/biso.

Comments should be emailed to biso_information@nps.gov, or mailed to Big South Fork NRRRA Headquarters, 4564 Leatherwood Road, Oneida, Tennessee, 37841. Any questions may be directed to Tom Blount at (423) 569-2404 ext. 252. All comments must be emailed or postmarked no later than 30 September 2003.

-NPS-
8/20/2003

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The National Park Service cares for special places saved by the American people so that all may experience our heritage.

An Environmental Assessment
for the
Plugging of an Abandoned Gas Well
In the William's Creek Area
of
The Big South Fork NRR

ENVIRONMENTAL ASSESSMENT

1.0 PURPOSE, NEED AND OBJECTIVES FOR ACTION

1.1 Purpose of Proposed Action

The purpose of the proposed action is to remove the threat of contamination and damage to park resources and values associated with an abandoned, unplugged gas well in the Williams Creek Area, of Big South Fork National River and Recreation Area (see attached map). The objectives of the proposed action are to:

- avoid or minimize impacts on park resources and values,
- protect human health and safety and allow for safe visitor experiences in the vicinity of the well, and
- prevent impairment of park resources and values.

1.2 Need for Proposed Action

Well #5175 was drilled and shut-in as a gas well in early 1982 by Trans-Tennessee Energy, Incorporated. The well is located on the Oneida North Quadrangle at 715101.517817E, 4049697.15511N UTM, NAD83. The drilling company filed for bankruptcy in the mid 1980's, leaving the well abandoned. This well is in the gorge, an area protected by BISO's enabling legislation. The well reservoir is under pressure and natural gas leaks up through the ground around the wellhead. When the ground is saturated by rain, natural gas bubbles up through the soil in a five foot diameter circle around the well. With time, the valves and equipment controlling the well pressure will eventually fail. The potential exists for damage to water resources, down-slope vegetation, and terrestrial and aquatic organisms in the protected area of the gorge due to the potential release of petroleum products below ground and on the surface. The well was identified on a priority list of wells that pose environmental threats in an oil and gas well inventory that was completed in 2001.

1.3 Related Environmental Documents

Existing environmental documents that are related to this Environmental Assessment (EA) are:

Oil and Gas Inventory for the Big South Fork National River and Recreation Area, Tennessee Department of Environment and Conservation, Division of Geology, 2001.

A Wildlife Management Plan for the Big South Fork National River and Recreation Area, James R. Clark, Thesis, Tennessee Technological University, 1984.

Water Resources Management Plan, Big South Fork National River and Recreation Area, Barbara Smyth Hamilton and Leslie Turrini-Smith, Tennessee Department of Environment and Conservation, Division of Water Pollution Control, Watershed Management Section, 1997.

Supplemental Draft General management Plan and Environmental Impact Statement, Big South Fork National River and Recreation Area, Kentucky/Tennessee, National Park Service, U. S. Department of the Interior, 2003.

These documents have been used for specific environmental information, documentation of existing field conditions and guidance for existing and proposed management practices for the Big South Fork NRRA.

1.4 Decisions to be Made

The purpose of the EA is to determine if this project may have significant impacts to the human environment. Impacts resulting from two possible alternatives (plugging and abandonment and “no action”) will be described and examined in detail in this document due to the fact that there are currently no Categorical Exclusions (CE) for oil and gas related activities that are considered to be Federal actions. An Environmental Impact Statement (EIS) may not be necessary for this activity, but will be prepared if it is determined that this project will have significant impacts to the human environment.

1.5 Scoping and Issues

This is the first compliance document that has been written that addresses the impacts for plugging abandoned oil and gas wells in National Park Service (NPS) units. The plugging of this well will protect human health and safety and prevent gas and other fluids leaking from the wellhead and casing that could contaminate and degrade water quality in Williams Creek and other downstream waterbodies in the Area. Although no formal public scoping sessions were done, many hours have been spent consulting with various agencies including Tennessee Division of Geology, Tennessee Division of Natural Heritage, Geologic Resources Division of the National Park Service, and BISO staff. An internal review of this document was conducted during February 2003 by BISO and Geologic Resources Division staff members.

Issues Evaluated in Detail:

1. Natural Resources (wetlands/vegetation, protected species, fish and wildlife)
2. Physical Environment (air quality, water, soils/geology)
3. Visitor Use and Experience (aesthetic resources/visitor experience, recreation)

These issues were identified through internal scoping and review of related environmental compliance documents for oil and gas activities in other NPS units.

Issues Eliminated from Detailed Analysis

The following resources would not be affected by any of the alternatives, or do not exist in the area:

1. Cultural, Historic and Archeological Resources
2. Economics Associated with Visitor Use and Experience
3. Floodplains
4. Prime and unique agricultural lands
5. Natural or Depletable Resources
6. Indian Trust Resources
7. Environmental justice

Cultural, Historic, and Archeological Resources

The road that forks west off of the “Shot-Off” Cliff route ending at the bluff edge allows access to a gas well. This unimproved rock road was constructed at least fifty years ago and has been in use periodically since that time. New proposals to upgrade and improve this gas well access road would have no effect on unidentified archeological or cultural resources located within the existing right-of-way. Additionally, impacts associated with the proposed roadwork in the existing road corridor are specifically excluded from additional Section 106 (National Historic Preservation Act) compliance requirements under exclusions IVB.6 & 7 of the 1995 Programmatic Agreement among the National Park Service, the Advisory Council on Historic Preservation and the National Conference of State Historic Preservation Officers.

The remaining issues were eliminated from further review and analysis because the proposed action would not have health or environmental effects on economics associated with visitor use and experience, floodplains, prime or unique agricultural farm lands, natural or depletable resources, Indian trust resources or environmental justice.

1.6 Permits

According to the General Rules and Regulations for the State of Tennessee Oil and Gas Board (Chapter 1040-2-9-.02), the local state inspector must be given notice of intent to plug a well at least 12 hours prior to plugging. A Plug and Abandonment Report (Form R-P & A-1) that has been signed by the inspector must be submitted to the Tennessee State Oil and Gas Board within 30 days after plugging and abandoning the well.

1.7 Law, Regulation and Policy

This EA is being prepared in accordance with federal law, regulation, and policy. The EA complies with the National Environmental Policy Act (NEPA) of 1969 and NPS *Director’s Order #12 and Handbook – Conservation Planning, Environmental Impact Analysis and Decision Making*. If it is determined after a 30-day public review period on the EA that there is no potential for significant impacts from the proposed action, a decision document called a Finding of No Significant Impact will be prepared. This document will be approved by the NPS Regional Director and shall describe the selected alternative, required mitigation measures, responses to substantive public comments, impairment findings, and any permitting or other regulatory requirements.

The following discussion is a summary of the basic management direction the NPS follows for permitting nonfederal oil and gas operations in units of the National Park System.

NPS Organic Act and the General Authorities Act

The responsibility of the NPS to restore disturbed lands in National Park System units arises from its mandates to conserve scenery and resources unimpaired; preserve wilderness character; and protect, manage, and administer units in light of their high public value and so as not to derogate the purposes for which they were established. See NPS Organic Act, 16 U.S.C. § 1 *et seq.* (1994); the General Authorities Act, 16 U.S.C. § 1a-1 (1994); and the Redwood Act amendments, 16 U.S.C. § 1a-1 (1994).

The NPS Organic Act (16 U.S.C. § 1, *et seq.*) provides the fundamental management direction for all units of the National Park System. Section 1 of the Organic Act states, in pertinent part, that the NPS shall:

“...promote and regulate the use of the Federal areas known as national parks, monuments, and reservations...by such means and measure as conform to the fundamental purpose of said parks, monuments and reservations, which purpose is to conserve the scenery and the natural and historic objects and the wild life therein and to provide for the enjoyment of the same in such manner and by such means as will leave them unimpaired for the enjoyment of future generations.” 16 U.S.C. §1.

The National Park System General Authorities Act, (16 U.S.C. § 1a-1 *et seq.*) affirms that while all national park system units remain "distinct in character," they are "united through their interrelated purposes and resources into one national park system as cumulative expressions of a single national heritage." The act makes it clear that the NPS Organic Act and other protective mandates apply equally to all units of the system. Further amendments to the Organic Act state that “[t]he authorization of activities shall be construed and the protection, management, and administration of these areas shall be conducted in light of the high public value and integrity of the National Park System and shall not be exercised in derogation of the values and purposes for which these various areas have been established, except as may have been or shall be directly and specifically provided by Congress.” 16 USC 1a- 1.

Current laws and policies require the analysis of potential effects to determine whether or not actions would impair park resources. While Congress has given the Service the management discretion to allow certain impacts within parks, that discretion is limited by the statutory requirement (enforceable by the federal courts) that the Park Service must leave park resources and values unimpaired, unless a particular law directly and specifically provides otherwise. 2001 Management Policies, §1.4.

The impairment that is prohibited by the Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible NPS manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values. Whether an impact

meets this definition depends on the particular resources and values that would be affected; the severity, duration, and timing of the impact; the direct and indirect effects of the impact; and the cumulative effects of the impact in question and other impacts.

NPS Management Policies

The following pertinent excerpts from *NPS Management Policies* provide specific direction for NPS natural system restoration:

Section 4.1.5 Restoration of Natural Systems

The Service will re-establish natural functions and processes in human-disturbed components of natural systems in parks unless otherwise directed by Congress. Landscapes disturbed by natural phenomena, such as landslides, earthquakes, floods, hurricanes, tornadoes, and fires, will be allowed to recover naturally unless manipulation is necessary to protect park developments or visitor safety. Impacts to natural systems resulting from human disturbances include the introduction of exotic species; the contamination of air, water, and soil; changes to hydrologic patterns and sediment transport; the acceleration of erosion and sedimentation; and the disruption of natural processes. The Service will seek to return human-disturbed areas to the natural conditions and processes characteristic of the ecological zone in which the damaged resources are situated. The Service will use the best available technology, within available resources, to restore the biological and physical components of these systems, accelerating both their recovery and the recovery of landscape and biological- community structure and function. Efforts may include, for example:

- Removal of exotic species;
- Removal of contaminants and non- historic structures or facilities;
- Restoration of abandoned mineral lands, abandoned or unauthorized roads, areas over- grazed by domestic animals, or disrupted natural waterways and/or shoreline processes;
- Restoration of areas disturbed by NPS administrative, management, or development activities (such as hazard tree removal, construction, or sand and gravel extraction) or by public use;
- Restoration of natural soundscapes; and
- Restoration of native plants and animals.

When park development is damaged or destroyed and replacement is necessary, the development will be replaced or relocated so as to promote the restoration of natural resources and processes.

Additional statements in *NPS Management Policies* that further guide the NPS's restoration of natural systems include the following:

Section 4.1 General Management Concepts

...Just as all components of a natural system will be recognized as important, natural change will also be recognized as an integral part of the functioning of natural systems. By preserving these natural components and processes in their

natural condition, the Service will prevent resource degradation, and therefore avoid any subsequent need for resource restoration...

The Service will not intervene in natural biological or physical processes, except:

- When directed by the Congress;
- In some emergencies in which human life and property are at stake;
- To restore native ecosystem functioning that has been disrupted by past or ongoing human activities; or
- When a park plan has identified the intervention as necessary to protect other park resources or facilities.

Any such intervention will be kept to the minimum necessary to achieve the stated management objectives.

Biological or physical processes altered in the past by human activities may need to be actively managed to restore them to a natural condition or to maintain the closest approximation of the natural condition in situations in which a truly natural system is no longer attainable. Prescribed burning and control of ungulates where predators have been extirpated are examples. The extent and degree of management actions taken to protect or restore park ecosystems or their components will be based on clearly articulated, well-supported management objectives and the best scientific information available.

4.4.2.4 Management of Natural Landscapes

Landscape and vegetation conditions altered by human activity may be manipulated where the park management plan provides for restoring the lands to a natural condition.

Landscape revegetation efforts will use seeds, cuttings, or transplants representing species and gene pools native to the ecological portion of the park in which the restoration project is occurring. Where a natural area has become so degraded that restoration with gene pools native to the park has proven unsuccessful, improved varieties or closely related native species may be used.

Landscape restoration efforts will use geological materials and soils obtained in accordance with geological and soil resource management policies. Landscape restoration efforts may use, on a temporary basis, appropriate soil fertilizers or other soil amendments so long as that use does not unacceptably alter the physical, chemical, or biological characteristics of the soil and biological community, and does not degrade surface or ground waters.

Program Objectives

The servicewide objectives for restoring disturbed areas are as follows:

- restoration of soil-geomorphic, chemical, and biologic characteristics and processes that were or are affected by modern human activities, so that the site will eventually reintegrate with the surrounding natural ecosystem functions and processes;

- elimination of threats to human safety and health that may be associated with disturbed areas;
- prevention of new and limitation of the effects of existing sources of disturbance.

NPS Administrative Documents

The NPS *Strategic Plan* (2000) specifically identifies two critical components of broader restoration activities. These are found in Long-Term Goal Ia1: (1) Ia1A - 10% of targeted acres of parkland, disturbed by development or agriculture, are restored; and (2) Ia1B – 10% of the exotic vegetation on targeted acres of parkland are contained. On an annual basis, parks report all effort spent in restoring acreage or containing exotic vegetation. Specific guidance to parks on reporting to these goals is found in the *Technical Guidance and PMDS Users' Guides*, including detailed information requirements for dollars, FTE, performance indicators, unit measures, baselines, performance targets, and who to contact with questions.

Park planning documents may also contain direction for restoration. General management plans developed under DO-2 *Park Planning* define desired future conditions for park resources that should provide direction for restoration.

Table 1, below, summarizes many, but not all, of the statutes, regulations, executive orders and policies that govern the management of minerals in National Park units. All alternatives described and evaluated in this EA are subject to these requirements.

Table 1. Current Legal and Policy Requirements

AUTHORITIES	RESOURCES AND VALUES AFFORDED PROTECTION
Statutes and Applicable Regulations	
NPS Organic Act of 1916, as amended, 16 U.S.C. §§ 1 <i>et seq.</i>	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, endangered and threatened species, visitor use and experience, and visual resources
National Park System General Authorities Act, 16 U.S.C. §§ 1a-1 <i>et seq.</i>	All resources, including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, endangered and threatened species, visitor use and experience, and visual resources
National Park Service Omnibus Management Act of 1998, 16 U.S.C. §§ 5901 <i>et seq.</i>	Any living or non-living resource
16 U.S.C. § 191j (commonly referred to as Park System Resource Protection Act)	Any living or non-living resource that is located within the boundaries of a unit of the National Park system, except for resources owned by a nonfederal entity
Clean Air Act, as amended, 42 U.S.C. §§ 7401-7671q; 40 CFR Parts 23, 50, 51, 52, 58, 60, 61, 82, and 93; 48 CFR Part 23	Air resources
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, 42 U.S.C. §§ 9601-9675; 40 CFR Parts 279, 300, 302, 355, and 373	Human health and welfare and the environment
Endangered Species Act of 1973, as amended, 16 U.S.C. §§ 1531-1544; 36 CFR Part 13; 50 CFR Parts 10, 17, 23, 81, 217, 222, 225, 402, and 450	Plant and animal species or subspecies and their habitat, which have been listed as threatened or endangered by the U.S. Fish and Wildlife Service (FWS) or the National Marine Fisheries Service (NMFS)
Federal Water Pollution Control Act of 1972 (commonly referred to as Clean Water Act), 33 U.S.C. §§ 1251 <i>et seq.</i> ; 33 CFR Parts 320-330; 40 CFR Parts 110, 112, 116, 117, 230-232, 323, and 328	Water resources, wetlands, and waters of the U.S.
Lacey Act, as amended, 16 U.S.C. §§ 3371 <i>et seq.</i> ; 15 CFR Parts 10, 11, 12, 14, 300, and 904	Fish and wildlife, vegetation
Migratory Bird Treaty Act, as amended, 16 U.S.C. §§ 703-712; 50 CFR Parts 10, 12, 20, and 21	Migratory birds
National Environmental Policy Act of 1969, 42 U.S.C. §§ 4321 <i>et seq.</i> ; 40 CFR Parts 1500-1508	The human environment (e.g. cultural and historic resources, natural resources, biodiversity, human health and safety, socioeconomic environment, visitor use and experience)
Noise Control Act of 1972, 42 U.S.C. §§ 4901-4918; 40 CFR Part 211	Human health and welfare
Oil Pollution Act, 33 U.S.C. §§ 2701-2761; 15 CFR Part 990; 33 CFR Parts 135, 137, and 150; 40 CFR Part 112; 49 CFR Part 106	Water resources, natural resources
Pipeline Safety Act of 1992, 49 U.S.C. §§ 60101 <i>et seq.</i> ; 49 CFR Subtitle B, Ch 1, Parts 190-199	Human health and safety, and the environment
Resource Conservation and Recovery Act, 42 U.S.C. §§ 6901 <i>et seq.</i> ; 40 CFR Parts 240-280; 49 CFR Parts 171-179	Natural resources, human health and safety
Rivers and Harbors Act of 1899, as amended, 33 U.S.C. §§ 401 <i>et seq.</i> ; 33 CFR Parts 114, 115, 116, 321, 322, and 333	Shorelines and navigable waterways, tidal waters, wetlands

AUTHORITIES	RESOURCES AND VALUES AFFORDED PROTECTION
Safe Drinking Water Act of 1974, 42 U.S.C. §§ 300f <i>et seq.</i> ; 40 CFR Parts 141-148	Human health, water resources
Executive Orders	
Executive Order 11988 - Floodplain Management, 42 Fed. Reg. 26951 (1977)	Floodplains, human health, safety, and welfare
Executive Order 11990 – Protection of Wetlands, 42 Fed. Reg. 26961 (1977)	Wetlands
Executive Order 12088 – Federal Compliance with Pollution Control Standards, 43 Fed. Reg. 47707 (1978)	Natural resources, human health and safety
Executive Order 12898 – Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, amended by Exec. Order No. 12948, 60 Fed. Reg. 6379 (1995)	Human health and safety
Executive Order 13112 – Invasive Species, 64 Fed. Reg. 6183 (1999)	Vegetation and wildlife
Executive Order 13186 – Responsibilities of Federal Agencies to Protect Migratory Birds, 66 Fed. Reg. 3853 (2001)	Migratory birds
Policies, Guidelines and Procedures	
NPS Management Policies (2001)	All resources including air resources, cultural and historic resources, natural resources, biological diversity, human health and safety, endangered and threatened species, visitor use and experience, visual resources
Dept. of the Interior, Departmental Manual, DM 516 –NEPA policies	All resources including cultural resources, historic resources, natural resources, human health and safety
Dept. of the Interior, Onshore Oil and Gas Order Number 2, Section III, Drilling Abandonment Requirements, 53 Fed. Reg. 46,810-46,811 (1988)	Human health and safety
NPS Director’s Order -12 and Handbook – National Environmental Policy Act (2001)	All resources including natural resources, cultural resources, human health and safety, socioeconomic environment, visitor use
NPS Director’s Order 77 – Natural Resources Management Guideline (1991)	Natural resources
NPS Director’s Order 77-1 – Wetland Protection	Wetlands
NPS Special Directive 93-4 – Floodplain Management Guideline	Floodplains

2.0 ALTERNATIVES

2.1 Description of Alternatives

No Action Alternative: Under the no action alternative, the well would remain in its current abandoned state and continue to leak gas as the equipment continues to corrode/degrade. Inevitably, the equipment controlling well pressure will fail. When that occurs, there are human health and safety threats and the potential for damage to water resources, down-slope vegetation, and terrestrial and aquatic organisms in the protected area of the gorge. Resource damage that could occur would be based on the possible loss of fluids from the well.

Alternative A, Environmentally Preferred, Preferred Alternative: Under this alternative, the access road and the production pad would be opened/improved, the well would be plugged and the access road and production pad would be rehabilitated and/or stabilized. Access would be a major part of this project. The wellhead and a small section of the access road are in the gorge. Vehicle access would be allowed through administrative access. The roads that were used during drilling are still visible and can be utilized if cleared of downed trees and regrowth. The road would be opened to a maximum width of 12 feet and overhanging limbs would be removed only high enough to allow clear passage of equipment. The grade of the road into the gorge exceeds 30% slope in some areas and would need to be accessed during the dry season. In addition, drainage structures such as water bars would be installed to control erosion on the steep slopes. Gravel would be placed on the road according to BISO Maintenance standards at a rate of 200 tons per mile. The production area around the wellhead has grown back in small pines, hardwood saplings, grasses and shrubs. An area no larger than 100' x 100' would be cleared of regrowth with appropriate equipment and graveled (if necessary) to allow access and maneuverability of plugging equipment and the placement of tanks/containers for all fluids that may be encountered during the plugging process. In addition, a liner would be placed around the wellhead and under all service vehicles in order to protect the soil and ground water from wellhead fluids and any fluids that may leak from the equipment. Earthen berms would be constructed of material hauled in to the site and would not be "borrowed" from federal surface. The well would be plugged according to the Department of Interior On-Shore Oil and Gas Order Number 2, Section III. G., Drilling Abandonment, and all other applicable state requirements. Plugging objectives are as follows:

1. Isolate all formations bearing oil, gas, geothermal resources and other prospectively valuable minerals.
2. Isolate all formations bearing usable-quality water (defined as waters containing up to 10,000 parts per million total dissolved solids).
3. Isolate the surface casing from the open hole below the bottom of the casing.
4. Seal the well at the surface.

Upon completion, the access road would remain open with all drainage control devices left in place. A gate would be placed at the rim of the gorge for administrative use and possible future horse trail designation as identified in the Draft General Management Plan for the Big South Fork National River and Recreation Area. The cleared area at the wellhead would be rehabilitated to match the surrounding contours. Duff from the surrounding forest floor will be used to mulch all disturbed areas. The gravel and berms would be removed from the site, contaminated material and liners would be removed, top soil would be replaced and the area would be seeded with native vegetation.

2.2 Alternatives Considered, But Dismissed

A third alternative that was considered but dismissed was the actual production of the well. This alternative is not acceptable due to the fact that the enabling legislation for BISO prohibits the exploration for or extraction of minerals from the gorge.

2.3 Environmentally Preferred Alternative

The environmentally preferred alternative is determined by applying the criteria stated in the National Environmental Policy Act of 1969 (NEPA), which is guided by the Council on Environmental Quality (CEQ). The CEQ provides direction that “[t]he environmentally preferable alternative is the alternative that will promote the national environmental policy as expressed in NEPA’s Section 101: (1) fulfill the responsibilities of each generation as trustee of the environment for succeeding generations; (2) assure for all Americans safe, healthful, productive, and aesthetically and culturally pleasing surroundings; (3) attain the widest range of beneficial uses of the environment without degradations, risk to health or safety, or other undesirable and unintended consequences; (4) preserve important historic, cultural, and natural aspects of our national heritage, and maintain, wherever possible, an environment which supports diversity, and variety, of individual choice; (5) achieve a balance between population and resource use which will permit high standards of living and a wide sharing of life’s amenities; and (6) enhance the quality of renewable resources and approach the maximum attainable recycling of depletable resources.”

After careful review of potential resource and visitor impacts, the environmentally preferred alternative is Alternative A, the Preferred Alternative. The Preferred Alternative, as described in section 2.1 above, causes the least damage to the biological and physical environment, and best protects, preserves, and enhances historic, cultural, and natural resources. This action alternative is the environmentally preferred because of the beneficial effects of removing the threats of contamination, reduced wildfire danger, and visitor and employee safety concerns, as well as the environmental benefit of reclaiming and stabilizing the access road and production pad.

2.4 Impact Summary Chart

IMPACT TOPIC	ALTERNATIVE A	NO ACTION
WETLANDS/VEGETATION	There are no known effects to wetlands. There would be short-term, negligible, adverse impacts to vegetation from construction activities. Impacts would be limited to the road corridors and the area around the wellhead that would be needed for the plugging operation. There would be a long-term, minor, beneficial effect on vegetation from removal of the wellhead, and rehabilitation of the disturbed production pad. There would be no impairment of wetlands or vegetation in the park. Short to long-term, moderate, adverse cumulative impacts could occur from extractive activities in the watershed.	If the wellhead equipment does not fail, there would be no impacts to wetlands and vegetation. Short to long-term, moderate, adverse impacts to down-slope wetlands and vegetation would occur if the deteriorating wellhead equipment fails. There would be no impairment of wetlands or vegetation in the park. Short to long-term, moderate, adverse cumulative impacts on wetlands and vegetation could occur from extractive activities in the watershed.
PROTECTED SPECIES	There would be short-term, negligible, adverse impacts to protected species as a result of the removal of vegetation on the access roads and around the wellhead. Openings created from the clearing of vegetation may provide new habitat for protected species that thrive in open areas, resulting in localized, long-term, minor beneficial impacts. There would be no impairment of protected species in the park. Long-term, moderate adverse, cumulative impacts on protected species could occur from extractive activities in the watershed.	If wellhead equipment does not fail, there would be no impacts on protected species. There would be long-term, major, adverse impacts to known protected species that exist downstream from the well if the wellhead equipment were to fail. There would be no impairment of protected species in the park. Long-term, moderate adverse, cumulative impacts on protected species could occur from extractive activities in the watershed.
FISH & WILDLIFE	There would be short-term, negligible, adverse impacts to fish and wildlife resources caused by removal of vegetation and resultant erosion during the plugging phase of the project. There would be no impairment to fish and wildlife resources in the park. Long-term, moderate, adverse, cumulative impacts on fish and wildlife resources could occur from extractive activities in the watershed.	Fish and wildlife resources would not be affected if the wellhead does not fail. There would be long-term, major, adverse impacts to fish and wildlife resources if the wellhead does fail. There would be no impairment of fish and wildlife in the park. Long-term, moderate, adverse, cumulative impacts to fish and wildlife resources could occur from extractive activities in the watershed.
AIR QUALITY	There would be localized, short-term, minor, adverse impacts on air quality as a result of emissions of particulates during well plugging and rehabilitation activities. There would be long-term, localized, minor, beneficial effects on the airshed when the leaking gas well is removed. There would be no impairment to air quality in the park. Short to long-term, moderate adverse cumulative impacts on air quality could occur from extractive activities in the watershed.	There would be localized, long-term, moderate, adverse impacts to air quality because of natural gas leaking from around the surface casing. There would be no impairment of air resources in the park. Short to long-term, moderate, adverse, cumulative impacts to air quality could occur from extractive activities in the watershed.
WATER QUALITY/HYDROLOGY	Short-term, negligible surface water quality impacts from erosion during the plugging and rehabilitation activities would be mitigated with the use of erosion control devices. Potential risks from an accidental release of fluids during the plugging operation would also be mitigated. There would be long-term, minor, beneficial effects on water quality and hydrology when the leaking gas well is removed and the area is rehabilitated. There would be no impairment to water quality or hydrology in the park. Short to long-term, moderate to major, adverse cumulative impacts on water quality and hydrology could occur from extractive activities in the watershed.	There could be short to long-term, major, adverse impacts on ground and surface waters if the wellhead fails. There would be no impairment to surface or groundwater in the park. Long-term, moderate to major, adverse, cumulative impacts to water quality and hydrology could occur from extractive activities in the watershed.

SOILS/GEOLOGY	Soil and water contamination would be eliminated due to the isolation of production zones after the plugging of the well. Erosion control and stabilization efforts would result in localized, long-term, minor, beneficial impacts. There would be no impairment to soils or geology in the park. Short to long-term, moderate to major, adverse cumulative impacts on soil and geologic resources could occur from extractive activities in the watershed.	Soil contamination from leaking brine and hydrocarbons would be a threat if the wellhead fails. Erosion from horse use on an unmaintained road would continue to occur, resulting in localized, long-term, minor, adverse impacts. There would no impairment to soils or geology in the park. Long-term, moderate to major, adverse cumulative impacts to soils and geologic resources could occur from extractive activities in the watershed.
AESTHETICS/VISITOR EXPERIENCE	Construction activities would result in short term, localized, minor, adverse impacts on aesthetics and visitor experiences. However, upon completion of reclamation activities, there would be localized, minor, beneficial effects on aesthetics/visitor experiences in the Williams Creek area of the park. Localized, short to long-term, moderate adverse cumulative impacts on aesthetics and visitor experiences could occur from extractive activities in the watershed.	There would be no impacts to aesthetics or visitor experiences unless emergency access to the area was required to respond to failure of the wellhead. Emergency access would result in short-term, moderate, adverse impacts on aesthetics/visitor experiences. Remediation of spilled materials and site reclamation could increase the disturbance area and recovery time for the affected area. Localized, long-term, moderate, adverse cumulative impacts on aesthetics and visitor experiences could occur from extractive activities in the watershed.
RECREATION	Stabilization of the access road would allow the Williams Creek area to continue to be used, resulting in a localized, long-term, moderate, beneficial impact on recreational uses. Visitors accessing the overlook near the well would be able to do so without the safety threats of a leaking gas well. Localized, short to long-term-term, moderate, adverse cumulative impacts on recreation could occur from extractive activities in the watershed.	<u>There would be</u> localized, long-term moderate, adverse impacts on recreation due to the threat to human health and safety from the leaking gas well and due to the lack of improved visitor access to the Williams Creek area of the park. Localized, short to long-term, moderate, adverse cumulative impacts on recreation could occur from extractive activities in the watershed.

3.0 AFFECTED ENVIRONMENT

3.1 General Environmental Setting

The well and the majority of its access road are located in the gorge overlooking the Williams Creek Drainage. Although in the gorge, the site is located well above the flood plain. Shot Off Cliff Road is the main road that accesses the park in this area and is well maintained to the park boundary. As the road enters the park, regular maintenance ends, but the road is kept open by horse back riders and hunters. As the road enters the gorge, vehicular access is prohibited. There is continued use by horse back riders and hikers. The spur road to the well was accessed by a full size vehicle in 1988 during a well inspection. The current access is by foot and horse back. The existing road corridor is extremely overgrown but still evident. The production area sits near the edge of a bluff overlooking the Williams Creek drainage. The production area is overgrown in small pines and hardwoods, bushes, vines, grasses and various herbaceous plants. A scenic overlook is just past the well. Visitors continue to access this overlook and have kept the route open. The road is not currently an approved trail or access and receives no routine NPS maintenance.

3.2 Natural Resources

Vegetation/Wetlands: Vegetation in the uplands and adjacent stream and river gorges of the project area consists predominantly of young (20-70 year old) second-growth forest. Natural communities present include upland old fields, pine, pine-oak and oak-hickory forests; upland wet depressions and seeps, bluff lines, sandstone outcrops, and cliff-faces. Particularly sensitive communities in the project area include upland wet depressions and seeps, and communities associated with sandstone outcrops.

Threatened and Endangered Species: Approximately 90 additional Kentucky or Tennessee-listed plants and animals have been reported from the park. The following federally listed or federal candidate plants and animals have been recorded in or near the Big South Fork NRRA:

PLANTS

Name	Rare	Threatened	Endangered	Candidate
<i>Arenaria cumbelandensis</i> (Cumberland sandwort)			X	
<i>Conradina verticillata</i> (Cumberland rosemary)		X		
<i>Schwalbea americana</i> (American Chaffseed)			X	
<i>Spiraea virginia</i> (Virginia spiraea)		X		

Plants were surveyed for potential effects from the proposed project. The access road and production area for the proposed project area were surveyed for rare, threatened and endangered plants by an NPS botanist in June 2002 and April 2003 (See attached memoranda). No federal or state plants of concern were identified in this area. In addition, Tennessee Division of Natural Heritage was contacted in April 2003 and there are no known occurrences of state listed rare, threatened or endangered plant species that could be impacted by the proposed activity (see attached email).

ANIMALS

Name	Rare	Threatened	Endangered	Candidate
<i>Alasmidonta atropurpurea</i> (Cumberland elktoe)			X	
<i>Epioblasma brevidens</i> (Cumberlandian combshell)			X	
<i>Epioblasma capsaeformis</i> (oyster mussel)			X	
<i>Epioblasma florentina</i> (yellow-blossom)			X	
<i>Epioblasma walkeri</i> (tan riffleshell)			X	
<i>Etheostoma percurum</i> (duskytail darter)			X	
<i>Myotis grisescens</i> (gray bat)			X	
<i>Myotis sodalis</i> (Indiana bat)			X	
<i>Pefias fabula</i> (little-wing pearly mussel)			X	
<i>Picoides borealis</i> (red-cockaded woodpecker)			X	
<i>Villosa trabalis</i> (Cumberland bean pearly musel)			X	

Protected river species would not be affected by activities on site. Bats may be found using the area and may den in adjoining forest areas. Activities on site will not impact bat species. The red-cockaded woodpecker has not been observed in this area in decades and the appropriate habitat does not exist at this site.

Fish and Wildlife: Wildlife in the project area varies from old-field upland species to animals that frequent old second-growth mesic forests. Examples of species associated with the park's old fields and surrounding forest edges, include white-tailed deer (*Odocoileus virginianus*), eastern cottontail (*Sylvilagus floridanus*), turkey (*Meleagris gallopavo*), eastern meadowlark (*Sturnella magna*), six-lined racerunner (*Cnemidophorus sexlineatus sexlineatus*), and slender glass lizard (*Ophisaurus attenuatus*). Commonly encountered animals which inhabit upland pine, pine-oak, and hickory forests are gray

fox (*Urocyon cinereoargenteus*), eastern chipmunk (*Tamias striatus*), sharp-shinned hawk (*Accipiter striatus*), pine warbler (*Dendroica pinus*), northern fence lizard (*Sceloporus undulatus hyacinthinus*), eastern hognose snake (*Heterodon platirhinos*), American toad (*Bufo americanus*), and marbled salamander (*Ambystoma opacum*). Fauna typical of mesic and streamside forests in the project area include river otter (*Lutra canadensis*), mink (*Mustela vison*), smoky shrew (*Sorex fumeus*), hooded warbler (*Wilsonia citrina*), wood duck (*Aix sponsa*), barred owl (*Strix varia*), and green salamander (*Aneides aeneus*) (U. S. Army Corps of Engineers 1976).

As part of the park's long-term monitoring program, an aquatic macroinvertebrate monitoring station was established near the mouth of Williams Creek in 1998. Eighty taxa were identified from sampling in 2001 giving Williams Creek a "good to excellent" bioclassification rating (Chuck Parker, personal communication, July 2002).

A survey of Williams Creek in July, August and September, 1981 (O'Bara, 1982) documented several species of fish including, stoneroller (*Campostoma anomalum*), river chub (*Nocomis micropogon*), rosefin shiner (*Notropis ardens*), rosyface shiner (*Notropis rubellus*), spotfin shiner (*Notropis spilopterus*), sand shiner (*Notropis stramineus*), telescope shiner (*Notropis telescopus*), creek chub (*Semotilus atromaculatus*), white sucker (*Catostomus commersoni*), northern hog sucker (*Hypentelium nigricans*), black redhorse (*Moxostoma duquesnii*), stonecat (*Noturus flavus*), flathead catfish (*Pylodictis olivaris*), rock bass (*Ambloplites rupestris*), bluegill (*Lepomis macrochirus*), longear sunfish (*Lepomis megalotis*), smallmouth bass (*Micropterus dolomieu*), spotted bass (*Micropterus punctulatus*), greenside darter (*Etheostoma blennioides*), rainbow darter (*Etheostoma caeruleum*), bluebreast darter (*Etheostoma camurum*), ashy darter (*Etheostoma cinereum*), spotted darter (*Etheostoma maculatum*), speckled darter (*Etheostoma stigmaeum*), logperch (*Percina caprodes*), and walleye (*Stizostedion vitreum*).

There have been no mussel species identified on Williams Creek proper. However, several living and dead specimens have been identified on the Big South Fork of the Cumberland River in the vicinity of the mouth of Williams Creek (Bakaletz, 1991). The shells of dead specimens included *Strophitus undulatus*, *Tritogonia verrucosa*, *Quadrula pustulosa*, *Pleurobema sintoxia*, *Elliptio dilatata*, *Ptychobranhus fasciolaris*, *Alasmidonta atropurpurea*, *Potamilus alatus*, *Liguma recta*, *Villosa iris*, *Lampsilis ventricosa*, *Lampsilis fasciola*, *Actinonaias pectorosa*, and *Epioblasma brevidens*. Live specimens identified in the vicinity of Williams Creek included *Elliptio dilatata*, *Actinonaias pectorosa*, and *Potamilus alatus*.

3.3 Physical Environment

Air Quality/Noise: The Shot Off Cliff/Williams Creek area is fairly remote with most of the access limited to foot and horse traffic. Vehicles and their associated effects on air quality can only access the area to the point of entering the gorge.

There is usually a strong odor of natural gas near the leaking wellhead. The wellhead could easily be overlooked by those accessing the overlook for the Williams Creek drainage, if not for the strong odor.

Water Quality: Water quality in Williams Creek has been measured intermittently from 1982 through 1997. Fourteen physical and chemical parameters have been measured, mostly designed to detect potential pollution sources related to coal mining, oil and gas extraction, and sewage discharge. Water quality has generally been good; however, bacteria values have remained somewhat elevated, indicating the stream is probably slightly affected by improper sewage disposal outside the park.

Soils/Geology: In the Williams Creek area, uplift of the plateau surface over geologic time, and differential weathering of easily erodable sandstone beds, has created numerous steep cliffs and resulted in the deposition of large boulders at the base of slopes and along stream courses. The topography of the area is characterized by broad, rolling upland ridges, narrow finger ridges, bluff lines, steep side-slopes, and narrow stream terraces and floodplains. Slopes in the project area range from nearly level ridge tops to extremely steep inclines, interspersed with vertical bluffs. Mineral resources above and within the Williams Creek gorge are coal, petroleum and natural gas, which are primarily found in the Mississippian formation (U. S. Army Corps of Engineers 1976).

The soils are moderately-to-well drained loamy soils derived from sandstone and shale, on the rolling plateau surface; and well drained loamy and stony soils from sandstone and shale on steep and hilly terrain. All of these soils are highly erodable (USDA Natural Resources Conservation Service 1995).

The access road to this gas well is mostly on a narrow ridge road and fairly level. As the road enters the gorge, the road slopes to an approximate 12% grade for 200 yards. This steep area is eroded to sandstone cobbles and solid rock. A second section of the access road slopes to 12% approximately 100 yards before accessing the wellhead. This section is sandy and eroded with a few areas of bare sandstone outcrops. The wellhead sits approximately 50 yards from a 100 foot sandstone bluff that overlooks the Williams Creek drainage.

3.4 Visitor Use and Experience

Aesthetic Resources: This access to the Williams Creek area is fairly remote and scenic, especially after entering the gorge. One particular point of interest is the use of car bodies to stabilize a narrow section of the road just after entering the gorge. Although not very aesthetically pleasing, this particular area has become a landmark for those who frequently use the area. A scenic overlook exists approximately 50 yards beyond the wellhead. This overlook provides an impressive view of the Williams Creek drainage and a geologic feature known as Pilot's Knob. Although this well was accessed by NPS staff with a four-wheel-drive vehicle in 1988, the trail is now narrow and used only by those wishing to access the overlook.

Recreation Resources: The access road in the park and the trail that enters the gorge and accesses the wellhead, are heavily used by horse back riders. There is some additional use by ORV's to the gorge and additional foot traffic beyond the gorge for hunting, hiking, fishing and swimming.

4.0 ENVIRONMENTAL CONSEQUENCES

This chapter describes the direct, indirect, and cumulative effects under the two alternatives. Impacts are described in terms of context, intensity, and duration. The context or extent of the impact may be localized or widespread. The duration of the impacts could be short-term lasting for less than one year, or long-term lasting for longer than one year. Environmental effects are also described in terms of adverse or beneficial negligible, minor, moderate, or major (see section 4.1).

4.1 Intensity of Impacts

The intensity of effects is defined as follows.

Negligible: An action that may cause an adverse or beneficial change to a resource, but the change would be so small that it would be imperceptible or at lower levels of detection. Negligible impacts would not cause an impairment of a park resource.

Minor: An action that may cause an adverse or beneficial change to a resource, the change would be detectable but slight. Minor impacts would not cause an impairment of a park resource.

Moderate: An action that would cause a readily apparent adverse or beneficial change to a resource. Moderate impacts would not cause an impairment of a park resource.

Major: An action that would cause severe, adverse or beneficial impacts to a resource. The impacts could be widespread, long-term and may cause an impairment of a park resource.

4.2 Findings On Impairment Of Park Resources And Values

The National Park Service may not allow the impairment of park resources and values unless directly and specifically provided for by legislation or by the proclamation establishing the park. Impairment that is prohibited by the National Park Service Organic Act and the General Authorities Act is an impact that, in the professional judgment of the responsible National Park Service manager, would harm the integrity of park resources or values, including the opportunities that otherwise would be present for the enjoyment of those resources or values (Management Policies, "Interpreting the National Park Service Organic Act," Section 3.5).

In determining whether impairment may occur, park managers consider the duration, severity, and magnitude of the impact; the resources and values affected; and direct,

indirect, and cumulative effects of the action. According to National Park Service policy, "An impact would be more likely to constitute an impairment to the extent that it affects a resource or value whose conservation is: a) Necessary to fulfill specific purposes identified in the establishing legislation or proclamation of the park; b) Key to the natural or cultural integrity of the park or to opportunities for enjoyment of the park; or c) Identified as a goal in the park's general management plan or other relevant National Park Service planning documents." (Director's Order 55)

4.3 Cumulative Effects

The Council on Environmental Quality (CEQ) regulations, which implement the National Environmental Policy Act, requires assessment of cumulative impacts in the decision-making process for federal projects. Cumulative impacts are defined as "the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions." (40 CFR 1508.7).

To assess cumulative impacts, this EA analyzes the direct and indirect impacts of the alternatives and then determines if they combine with other past, present, or reasonably foreseeable future extractive actions to create a cumulative effect. For this analysis, the cumulative effects area is the Big South Fork NRRA watershed. Past extractive actions that have taken place in the watershed that would contribute to a cumulative effect include strip and deep mining for coal and exploration, drilling and production of oil and gas resources. Current extractive actions that would contribute to a cumulative effect include logging, erosion from unreclaimed strip mines and ongoing exploration, drilling and production of oil and gas resources. Reasonably foreseeable future extractive actions that would contribute to a cumulative effect include deep and strip mining for coal by the Tennessee Valley Authority on the Royal Blue Wildlife Management Area, exploration, drilling and production of oil and gas resources, logging and road construction.

4.4 Overview of Environmental Effects

Under the No Action Alternative, the overall long-term adverse effects on the environment that would be of greatest concern would be associated with the possibility of wellhead failure. There is the potential for an uncontrolled release of contaminants from the wellbore (such as brine and hydrocarbons) into the environment. Such a release could damage water resources, down-slope vegetation, and terrestrial and aquatic organisms in the gorge area of the park. Until the well is plugged it would remain a substantial threat to human health and safety. Also, under this alternative, the access road and production area would continue to revegetate, making emergency access extremely difficult and would delay emergency response actions. Even though it is inevitable that this well will eventually fail, NEPA requires that impacts to the environment under the No Action Alternative examine current conditions. There would be no impacts to negligible impacts to most of the resource topics discussed in this EA if the wellhead does not fail. Only those resources affected by the release of methane gas into the atmosphere would continue to have short-term, adverse impacts.

Under Alternative A, the environmentally preferred alternative, the overall effects on the environment would be short-term and minor. Short-term, adverse impacts would include noise from mechanical equipment used during the duration of the project and erosion from new surface disturbances. Upon project completion, the area would naturalize and access roads that are currently eroding would be stabilized with erosion control structures and gravel. Therefore, the proper plugging and abandonment of this well would provide long term, beneficial protection of park resources.

4.5 Natural Resources

Wetlands/Vegetation

No Action Alternative

Under the No Action alternative, eventual wellhead equipment failure would contaminate soils and water having widespread, short to long-term, moderate impacts on both wetlands and vegetation. Wetlands and vegetation would not be affected if the wellhead does not fail.

Cumulative Impacts: Past, present and reasonable foreseeable future extractive activities in the watershed could result in short to long-term, moderate, adverse impacts on wetlands and vegetation.

Conclusion: If the wellhead does not fail, there would be no impacts to wetlands and vegetation. Widespread, short to long-term, moderate, adverse impacts to down-slope wetlands and vegetation could occur if the deteriorating wellhead equipment fails. There would be no impairment of wetlands or vegetation in the park. Short to long-term, moderate, adverse cumulative impacts on wetlands and vegetation could occur from extractive activities in the watershed.

Alternative A – Proposed Action

During the clearing phase of the project, impacts under Alternative A would include the loss of vegetation on the access roads and the production pad. The vegetation to be removed ranges from vines and shrubs to saplings up to five inches in diameter. These short-term, adverse, negligible impacts would be mitigated during the rehabilitation/stabilization phase of the project. There would be a long-term, minor, beneficial effect on vegetation from removal of the wellhead, and rehabilitation of the disturbed production pad.

Cumulative Impacts: Cumulative impacts on wetlands and vegetation in the watershed as a result of past, present, and reasonably foreseeable future extractive activities in the watershed taken under Alternative A could result in short to long-term, moderate, adverse impacts.

Conclusions: There are no known effects to wetlands. There would be short-term, negligible, adverse impacts to vegetation from construction activities. Impacts would be limited to the road corridors and the area around the wellhead that would be needed for

the plugging operation. There would be a long-term, minor, beneficial effect on vegetation from removal of the wellhead, and rehabilitation of the disturbed production pad. There would be no impairment of wetlands or vegetation in the park. Short to long-term, moderate, adverse cumulative impacts could occur from extractive activities in the watershed.

Protected Species

No Action Alternative

If the wellhead equipment were to fail under the No Action alternative, degraded water quality could result in long-term, major, adverse impacts on protected aquatic species known to exist downstream from the well at the mouth of Williams Creek.. Protected species would not be adversely impacted if the wellhead equipment does not fail.

Cumulative Impacts: Under the No Action Alternative, past, present and reasonable foreseeable future extractive activities could result in long-term, moderate adverse impacts on protected species in the watershed.

Conclusion: If wellhead equipment does not fail, there would be no impacts on protected species. There would be long-term, major, adverse impacts to known protected species that exist downstream from the well if the wellhead equipment were to fail. There would be no impairment of protected species in the park. Long-term, moderate adverse, cumulative impacts on protected species could occur from extractive activities in the watershed.

Alternative A

Under Alternative A, erosion from construction activities would result in short-term, negligible adverse impacts to protected aquatic species downstream of the project area. It may be possible that the clearing and removal of vegetation on the access roads and the production pad may provide future habitat for several rare plants that thrive in those types of environments, resulting in localized, long-term, minor, beneficial impacts to protected species.

Cumulative Impacts: Past, present and future foreseeable extractive actions in the watershed would result in long-term, moderate adverse, cumulative impacts on protected species.

Conclusions: There would be short-term, negligible, adverse impacts to protected species as a result of the removal of vegetation on the access roads and around the wellhead. Openings created from the clearing of vegetation may provide new habitat for protected species that thrive in open areas, resulting in localized, long-term, minor beneficial impacts. There would be no impairment of protected species in the park. Long-term, moderate, adverse, cumulative impacts on protected species could occur from extractive activities in the watershed.

Fish and Wildlife Resources

No Action Alternative

Under the No Action alternative, eventual failure of the wellhead could contaminate soils and surface waters, having long-term, moderate to major, adverse impacts to fish and wildlife resources. Since the impacts on park resources from a spill would be remediated, it is unlikely that there would be an impairment to fish and wildlife resources under this alternative. There would be no impacts on fish and wildlife resources if the wellhead does not fail.

Cumulative Impacts: Past, present, and reasonable foreseeable future extractive activities in the watershed could result in long-term, moderate adverse, cumulative impacts to fish and wildlife resources.

Conclusion: Fish and wildlife resources would not be affected if the wellhead does not fail. There would be long-term, major, adverse impacts to fish and wildlife resources if the wellhead does fail. There would be no impairment of fish and wildlife in the park. Long-term, moderate, adverse, cumulative impacts to fish and wildlife resources could occur from extractive activities in the watershed.

Alternative A

Under Alternative A, the removal of brush and vegetation during construction activities may cause short-term, negligible, adverse impacts to the nesting and feeding habitats of some wildlife and birds. Upon rehabilitation, additional habitat would be provided. Erosion from the site would be mitigated by using erosion control devices.

Cumulative Impacts: Past, present, and reasonably foreseeable future extractive actions in the watershed would result in long-term, moderate, adverse, cumulative impacts on fish and wildlife resources.

Conclusions: There would be short-term, negligible, adverse impacts to fish and wildlife resources caused by removal of vegetation and resultant erosion during the plugging phase of the project. There would be no impairment to fish and wildlife resources in the park. Long-term, moderate, adverse, cumulative impacts on fish and wildlife resources could occur from extractive activities in the watershed.

4.6 Physical Environment

Air Quality

No Action Alternative

Under the No Action alternative, localized, long-term, moderate, adverse impacts to air quality would continue because of methane gas leaking from around the surface casing. Methane gas would cause an overall degradation to the natural ambient air, but would not exceed acceptable state air quality standards. The human health and safety dangers and

potential for damage to park resources associated with a flammable substance being vented into the atmosphere is of great concern to park management.

Cumulative Impacts: Past, present and reasonable foreseeable future extractive activities in the watershed could result in long-term, moderate, adverse, cumulative impacts to air quality in the watershed under the No Action Alternative.

Conclusion: There would be localized, long-term, moderate, adverse impacts to air quality because of methane leaking from around the surface casing. There would be no impairment of air resources in the park. Long-term, moderate, adverse, cumulative impacts to air quality could occur from extractive activities in the watershed.

Alternative A

Short term, minor, adverse impacts to air quality would occur under alternative A from equipment exhaust venting into the atmosphere during the plugging operation. Possible emissions include particulate matter, nitrogen oxides, volatile organic compounds, carbon monoxide and sulfur dioxide. There would be long-term, localized, minor, beneficial effects on the airshed when the leaking gas well is removed.

Cumulative Impacts: Cumulative impacts on air quality in the watershed as a result of past, present and reasonably foreseeable future extractive actions would be long-term, moderate adverse impacts.

Conclusion: There would be localized, short-term, minor, adverse impacts on air quality as a result of emissions of particulates during well plugging and rehabilitation activities. . There would be long-term, localized, minor, beneficial effects on the airshed when the leaking gas well is removed. There would be no impairment to air quality in the park. Long-term, moderate, adverse cumulative impacts on air quality could occur from extractive activities in the watershed.

Water Quality/Hydrology

No Action Alternative

Under the No Action alternative, there could be short to long-term, major, adverse impacts on surface and groundwaters from contamination from failure of the surface casing. If the valve at the wellhead were to fail and a well “blow out” were to occur, fluids that are in the wellbore (e.g., brine or hydrocarbons) could be released into surface waters. If the surface casing becomes damaged during a well blow-out, groundwater resources may also be contaminated. This well is currently leaking below the surface because gas bubbles up through the soil when the ground is saturated from rain. Gas and fluids leaking from the surface casing may already be affecting ground water quality.

Cumulative Impacts: Past, present and reasonable foreseeable future extractive activities, could result in long-term, moderate to major adverse cumulative impacts to water quality and hydrology in the watershed.

Conclusion: There could be short to long-term, major, adverse impacts on ground and surface waters if the wellhead fails. There would be no impairment to surface or groundwaters in the park. Long-term, moderate to major, adverse, cumulative impacts to water quality and hydrology could occur from extractive activities in the watershed.

Alternative A

Under Alternative A, the potential for short-term, negligible, adverse impacts on surface water quality from erosion during well plugging and rehabilitation activities would be mitigated with the use of erosion control devices. The accidental release of fluids from the wellbore that could occur during plugging activities would have an adverse impact on water quality. These risks would be reduced to a negligible level with the use of pumps, containers, berms and liners. All usable ground water zones would be protected with the plugging and abandonment of this well. There would be long-term, minor, beneficial effects on water quality and hydrology when the leaking gas well is removed and the area is rehabilitated.

Cumulative Impacts: Cumulative impacts on water quality and hydrology in the watershed as a result of past, present and reasonably foreseeable future extractive actions could result in long-term, moderate to major adverse impacts.

Conclusion: Short-term, negligible surface water quality impacts from erosion during the plugging and rehabilitation activities would be mitigated with the use of erosion control devices. Potential risks from an accidental release of fluids during the plugging operation would also be mitigated. There would be long-term, minor, beneficial effects on water quality and hydrology when the leaking gas well is removed and the area is rehabilitated. There would be no impairment to water quality or hydrology in the park. Long-term, moderate to major, adverse cumulative impacts on water quality and hydrology could occur from extractive activities in the watershed.

Soils/Geology

No Action Alternative

Under the No Action alternative, there would be no new surface disturbances, but continued use by horses without accompanying stabilization techniques would cause additional erosion, resulting in localized, long-term, minor, adverse impacts. The Draft GMP for Big South Fork NRRRA identifies this trail as the Shot-Off Spur Trail that would be stabilized and maintained if designated as a horse trail. It is highly unlikely that this trail would be developed as long as the hazards associated with a leaking gas well are within close proximity to the proposed trail. If the well remains unplugged, potential contamination to soils from leaking brine and hydrocarbons would continue to be a threat.

Cumulative Impacts: Past, present and reasonable foreseeable future extractive activities, could result in long-term, moderate to major, adverse cumulative impacts to soils and geology in the watershed.

Conclusion: Soil contamination from leaking brine and hydrocarbons would be a threat if the wellhead fails. Erosion from horse use on an unmaintained road would continue to occur, resulting in localized, long-term, minor, adverse impacts. There would no impairment to soils or geology in the park. Long-term, moderate to major, adverse cumulative impacts to soils and geologic resources could occur from extractive activities in the watershed.

Alternative A

Under Alternative A, surface disturbances during the well plugging and rehabilitation activities would cause erosion, but would be reduced to localized, short-term, minor, adverse impacts due to the use of erosion control devices and work being performed during the dry season. Erosion from continued horse back use on the access routes would be minimized by stabilization techniques (i.e. water bars). Soil contamination would be eliminated due to the isolation of production zones during the plugging of the well. There would also be localized, long-term, moderate, beneficial impacts as a result of stabilization of erosion prone areas and revegetation efforts.

Cumulative Impacts: Cumulative impacts on soils and geology in the watershed as a result of past, present and future foreseeable extractive actions would be long-term, moderate to major, adverse impacts.

Conclusion: Soil and water contamination would be eliminated due to the isolation of production zones after the plugging of the well. Erosion control and stabilization efforts would result in localized, long-term, moderate, beneficial impacts. There would be no impairment to soils or geology in the park. Long-term, moderate to major, adverse cumulative impacts on soil and geologic resources could occur from extractive activities in the watershed.

4.7 Visitor Use and Experience

Aesthetics/Visitor Experience

No Action Alternative

Under the No Action alternative, the roads and production area would continue to naturalize with existing vegetation. There would be no noise impacts or impacts to aesthetics and visitor experience if the wellhead does not fail. The threat to park resources and human health and safety from an abandoned well would continue. If the wellhead fails and results in a hydrocarbon or brine spill or fire, emergency response actions would require accessing the site with heavy equipment, resulting in localized, short-term, moderate, adverse impacts on aesthetics and visitor experiences.

Cumulative Impacts: Past, present and reasonable foreseeable future extractive activities in the watershed could result in localized, long-term, moderate, adverse impacts on aesthetics and visitor experiences.

Conclusion: There would be no impacts to aesthetics or visitor experiences unless emergency access to the area was required to respond to failure of the wellhead. Emergency access would result in short-term, moderate, adverse impacts on aesthetics/visitor experiences. Remediation of spilled materials and site reclamation could increase the disturbance area and recovery time for the affected area. Localized, long-term, moderate, adverse cumulative impacts on aesthetics and visitor experiences could occur from extractive activities in the watershed.

Alternative A

Under Alternative A, noise caused by the equipment used to complete the project would cause localized, short term, minor, adverse impacts on aesthetics and visitor experiences. There would also be localized, short term, minor, adverse impacts due to disturbance to overgrown areas. Visitors and users of the area may find construction in this rather remote area to not be aesthetically pleasing. However, these ground disturbances near the wellhead would be mitigated and returned to a natural state with stabilization and rehabilitation measures. The access road will remain open and all erosion control devices will remain in place. There would be localized, long-term, minor, beneficial impacts to aesthetics and visitor experiences since the area near the wellhead would be allowed to revegetate to a natural condition and the access road will be stabilized and accessible to park visitors.

Cumulative Impacts: Past, present and reasonably foreseeable future extractive actions would result in localized, long-term, moderate adverse impacts on aesthetics and visitor experiences in the watershed.

Conclusion: Construction activities would result in short term, localized, minor, adverse impacts on aesthetics and visitor experiences. However, upon completion of reclamation activities, there would be localized, minor, beneficial effects on aesthetics/visitor experiences in the Williams Creek area of the park. Localized, long-term, moderate, adverse, cumulative impacts on aesthetics and visitor experiences could occur from extractive activities in the watershed.

Recreation

No Action Alternative

Under the No Action alternative, the leaking gas well is a visitor safety issue. The odor of natural gas leaking from the well can be detected as far as 100 feet from the wellhead. Visitors who are currently accessing the overlook on horseback tie off their horses within 15 feet of the wellhead and can smell the leaking methane gas. Since the road would not be reopened under Alternative A, recreational access would not be improved to horse trail standards, limiting or eliminating recreational use for some users. Adverse impacts to recreation and the threat to human health and safety from the release of hydrocarbons from the well would be localized, long-term, and moderate.

Cumulative Impacts: Past, present and reasonable foreseeable future extractive activities, could result in localized, long-term, moderate, adverse impacts on recreation in the watershed.

Conclusion: There would be localized, long-term moderate, adverse impacts on recreation due to the threat to human health and safety from the leaking gas well and due to the lack of improved visitor access to the Williams Creek area of the park. Localized, long-term, moderate, adverse cumulative impacts on recreation could occur from extractive activities in the watershed.

Alternative A

Under Alternative A, the access road to the well would be stabilized and improved to a minimum standard. These roads are proposed horse trails in the Draft GMP, and are currently receiving heavy use from horse traffic. Stabilization of the access road would allow the area to continue to be used, resulting in a localized, long-term, moderate, beneficial impact on recreation in the Williams Creek area. Also, those accessing the overlook in the area of the well would be able to do so without the potential threats from a leaking gas well.

Cumulative Impacts: Cumulative impacts on recreation in the watershed as a result of actions taken under Alternative A and past, present and future foreseeable future extractive actions would be localized, long-term, moderate, adverse impacts.

Conclusion: Stabilization of the access road would allow the Williams Creek area to continue to be used, resulting in a localized, long-term, moderate, beneficial impact on recreational uses. Visitors accessing the overlook near the well would be able to do so without the safety threats of a leaking gas well. Localized, long-term, moderate, adverse cumulative impacts on recreation could occur from extractive activities in the watershed.

5.0 CONSULTATION AND COORDINATION

5.1 List of Preparers/Consultants

Etta Spradlin, Biological Science Technician, BISO, NPS
Tom Blount, Chief of Resource Management, BISO, NPS
Steve Bakaletz, Wildlife Biologist, BISO, NPS
Tom DesJean, Cultural Resource Specialist/Archeologist, BISO, NPS
Bryan Wender, Botanist, BISO, NPS
Chris Stubbs, Community Planner, BISO, NPS
Pat O'Dell, Petroleum Engineer, GRD, NPS
Lisa Norby, Petroleum Geologist, GRD, NPS
Jami Hammond, Environmental Protection Specialist, SERO
Mike Hoyal, Assistant State Geologist, TDEC, Division of Geology

Mike Burton, Professional Geologist, TDEC, Division of Geology
Jeff Laxton, Environmental Specialist/Field Inspector, TDEC, Division of Geology

6.0 REFERENCES

U. S. Army Corps of Engineers. 1976. Big South Fork National River and Recreation Area, Final Environmental Impact Statement. U. S. Army, Nashville District. Nashville, Tennessee.

Parker, Charles E. 2002. United States Geological Survey. Aquatic Specialist. Personal Communication. July 8, 2002.

Bakaletz, Steven. 1991. Mussel Survey of the Big South Fork National River and Recreation Area. Thesis. Tennessee Technological University.

O'Bara, Christopher J. 1982. A Survey of Water Quality, Benthic Macroinvertebrates and Fish For Sixteen Streams within the Big South Fork National River and Recreational Area. Thesis. Tennessee Technological University.

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State of Tennessee State Oil and Gas Board. 1990. General Rules and Regulations. Nashville, Tennessee 37243.

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Wender, Bryan. National Park Service Botanist. Big South Fork National River and Recreation Area. Memorandum. May 6, 2003.

Webber, Michelle. National Park Service Botanist. Mammoth Cave National Park. Letter dated August 26, 2002.

Commonwealth of Kentucky. The Kentucky State Nature Preserves Commission. Monitored Species of McCreary County, Kentucky. Online Database Query. Updated May 14, 2003.

Tennessee Department of Conservation. Division of Natural Heritage. Rare Species of Pickett, Scott, Fentress and Morgan Counties. Online Database Query. Updated April 10, 2003.

May 6, 2003

Memorandum

To: Tom Blount, Chief of Resource Management, BISO

From: Bryan Wender, Botanist, BISO

Subject: Spring Plant Survey at Well #5175

On April 21, 2003, I conducted a survey for spring-flowering T & E plants along the access road and production pad at well #5175. No rare plant species were identified. Summer plants were previously inventoried by Michelle Webber, Botanist, Mammoth Cave National Park, in June, 2002. Michelle did not identify plant species of concern. The Tennessee Division of Natural Heritage database includes no records of rare plant species in the vicinity of well #5175. I conclude that the proposed action at well #5175 will have no impacts on sensitive plant resources.

August 26, 2002

Michele M. Webber
Mammoth Cave National Park
P.O. Box 7
Mammoth Cave, KY

Chief of Resource Management
Big South Fork NRR
Oneida, TN

Dear Mr. Blount,

Sixteen oil and gas sites and the proposed section of the Cumberland Trail were visited within Big South Fork National River and Recreation Area and the Obed Wild and Scenic River during the week of June 3, 2002. All sites including the access roads to each site and the surrounding woods, were surveyed for T&E species. No T&E species were located. However, *Casteana pumila* (Allegheny chinkapin), which is considered threatened in the state of Kentucky, was observed at two locations. At permit site 1577 a single *C. pumilla* was observed in flower with seven stems. At permit site 7645 at least five *C. pumilla* were observed along the entrance road to the site and two more were observed at the site. A species list is included for each site surveyed. This may be helpful in assessing change over time, especially if these sites are further disturbed or, conversely, slated for restoration.

Enclosed are individual reports for each site visited including the proposed section of the Cumberland Trail at The Obed Wild and Scenic River. Each report consists of a list of species encountered at each site including their physiognomy and wetland classification, and notes on unidentified species encountered at the site. The reports also include Floristic Quality Assessment information, which will be useful as the condition of these sites is assessed over time.

Several invasive species, as determined by the Tennessee Exotic Pest Plant Council, were noted, including Japanese honeysuckle, multiflora rose, Japanese spirea, sweet clover, ox-eyed daisy, and Korean lespedeza. Attacking these species now while their populations are small and before further disturbance occurs can and will help to protect the native species in these areas. With the proper knowledge and planning, control efforts can yield significant results. Without control efforts and with further disturbance these small, isolated occurrences are likely to explode. All non-native species appear in bold type on the species lists for each site. Not all of these species are invasive. A table is included in the final report listing the invasive species and the severity of their threat to natural areas (i.e., their rank of invasiveness). This ranking indicates how likely it is that the species of interest will invade natural, undisturbed areas.

A single visit during the summer did not provide enough flowering material to fully characterize a site. The spring ephemeral species were completely missed during this survey and many of the

late summer and fall species are just beginning to leaf-out and were not identifiable. The T & E species lists for Scott, Morgan, Fentress and Anderson counties include many species that are identifiable only during specific seasons. For example, the pale corydalis (*Coydalis sempervirens*) and the Cumberland sandwort (*Arenaria cumberlandensis*) both listed as federally endangered species, flower, fruit, and disappear before the onset of summer. While the habitats surveyed for this particular group of oil and gas permits would exclude the possibility of a missed occurrence of the Cumberland sandwort, there is justifiable concern for the possible missed occurrence of the pale corydalis in these upland, wooded sites. The seasonality of this survey must be considered when completing compliance documentation.

I will be faxing the reports for each permit site to 423-569-5733, as well as mailing a final report to Big South Fork National River and Recreation Area. If you have any questions, please let me know.

Sincerely,

Michele M. Webber

Etta Spradlin
Biological Science Technician
Big South Fork National River and Recreation Area
4564 Leatherwood Road
Oneida, TN 37841

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Fax: (423)569-5733
E-mail: etta_spradlin@nps.gov

----- Forwarded by Etta Spradlin/BISO/NPS on 08/26/03 09:42 AM -----

Bryan Wender

04/14/03 01:08 PM

To: Etta Spradlin/BISO/NPS@NPS

cc:

Subject: contact with Roger McCoy, RE: well 5175

Etta, I contacted Roger and he sent me the most updated version of their T&E data. There are no known occurrences of T&E species that will be impacted by the proposed activity.

Bryan W. Wender, Botanist
National Park Service
Big South Fork NRRRA
423-569-2404 x 251

----- Forwarded by Bryan Wender/BISO/NPS on 04/14/2003 01:04 PM -----

"Roger McCoy"
<Roger.McCoy@state.
tn.us>

04/14/2003 10:54 AM
EST

To: <bryan_wender@nps.gov>, <Ron_Cornelius@nps.gov>

cc:

Subject: data from the division of Natural Heritage

Bryan/Ron:

The attached .exe file contains the ArcView shape file from our rare species database. I buffered the park by 1.0 mile. Please keep in mind that the data base does not represent a comprehensive survey of the park and so there are likely gaps. The data coverage does represent the rare species known to occur in the park by our division.

Data are unprojected (decimal degrees NAD83). Contact me should you have any questions.

Roger

Roger McCoy
Botanist/Heritage Inventory Coordinator
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